Auditor-provided Tax Services and Clients' Tax Avoidance:

Do Auditors Draw a Line in the Sand for Tax Advisory Services?

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November 2019

Acknowledgments: We are thankful for the support and guidance of Edmund Outslay and helpful comments from James Anderson, Nathan Goldman, Chris Hogan, Preetika Joshi, Michelle Nessa, Jim Stekelberg, Sarah Stuber, Dan Wangerin, Brian Wenzel, and the workshop participants at Michigan State University, the 2018 EIASM Conference on Current Research in Taxation, the 2018 AAA Midwest Region Meeting, the 2018 National Tax Association Annual Conference, 2019 ATA Mid-Year Meeting, and members of the tax reading group at Texas A&M University. We gratefully acknowledge financial support from the Eli Broad College of Business at Michigan State University. Joanna Shaw also acknowledges the generous support from the Grant Thornton Doctoral Fellowship. All errors are our own.

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Abstract

This study investigates U.S. audit firms' compliance with the prohibition on the supply of tax-aggressive strategies to their audit clients. Incidences of audit failures and tax aggressiveness linked to non-audit services, along with the resurgence of advisory services as the main revenue source, have called into question audit firms' compliance with existing regulations. Using quantile regressions, we observe an upper bound in the positive association between auditor-provided tax services (APTS) and tax avoidance documented in prior studies. We interpret the existence of an upper bound as evidence of audit firms' compliance. Interestingly, we observe that the association turns negative for high tax avoidance clients. This non-linearity suggest audit firms also take steps to reduce their level of exposure to tax-aggressive clients. While our main results suggest compliance, trend analyses shows an increase in the level of tax avoidance associated with APTS during our sample period. We also find a more persistent association for larger clients, suggesting economic bonding influences the level of tax aggressiveness an audit firms' is willing to provide. These findings should be informative to regulators on compliance with existing regulations.

Keywords: Auditor-provided tax services, Tax avoidance, Effective tax rate, PCAOB regulation, Non-audit services

JEL Classification: H25, G30

Data Availability: All data are publicly available from sources identified in the paper.

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1. Introduction

There are renewed concerns among audit regulators about the provision of non-audit services (NAS), in particular tax services, to audit clients. This is evident by the Financial Reporting Council (the audit regulatory body in the U.K.) suggesting that accounting firms should restrict their services to audit-only functions (Marriage 2018). Also, the European Union (E.U.) placed new restrictions on permitted NAS and a cap on the amount of non-audit services that can be provided to audit clients as a response to the audit failures during the global financial crisis (European Council Directive 2014/56/EU).[1] In the United States, the Public Company Accounting Oversight Board (PCAOB) developed Rule 3522 in 2006 to specifically prohibit audit firms from providing "tax aggressive" services to their public-listed clients.[2] Nonetheless, the PCAOB has expressed concern about 'a compliance problem with existing rules' following evidence of tax-aggressive strategies linked to NAS (Harris 2014).[3] Finally, recent years has witness the resurgence of consultancy fees as the dominant revenue source for audit firms, raising concerns about a return to the aggressive marketing days of the 1990s (Rapoport 2018). In light of the PCAOB's concern, coupled with the wider debate on the provisions of non-audit services, we investigate whether U.S. audit firms are in compliance with current rules on non-audit service.

[1] Prohibited NAS include provision of tax advisory and compliance services, involvement in management decision-making, advisory services related to capital or debt financing and structuring, and certain legal services.

[2] Throughout the paper we use the term audit firm to refer to the accounting firms subject to PCAOB regulations and clients to refer to the public-listed companies that use the services of the audit firm.

[3] In 2015, the PCAOB launched a review into the "nature of the tax services that auditors are performing for their audit clients" following accusations that PwC provided tax-aggressive strategies that allowed Caterpillar to avoid $2.4 Billion in taxes (U.S. Audit Regulator Scrutinizing PwC over Caterpillar Tax Advice, WSJ 11/18/2014). The PCAOB continues to monitor the effect of tax services on auditor independence (quality) as part of their strategic plan (PCAOB 2018).

PCAOB Rule 3522 creates an upper bound on the scope of tax planning strategies an audit firm can provide to its audit clients. While there is not a bright-line test for tax-aggressiveness, PCAOB Rule 3522 defines a non-aggressive tax position as one that "is at least more likely than not to be allowable under applicable tax laws." This definition places considerable judgment in the hands of the audit firm and their client to decide whether a particular tax strategy is aggressive. For example, the Internal Revenue Service (IRS) ruled that the international tax structure adopted by Caterpillar for reporting profits in Switzerland lacked economic substance and was abusive of the tax code. However, PricewaterhouseCoopers (Caterpillar's external auditor and source of the tax strategy) countered that the tax structure conforms to all relevant tax laws and is therefore not abusive. Caterpillar is still fighting this IRS ruling in courts. Given the ambiguity surrounding tax-aggressiveness, an audit firm may assert that its tax strategies are in compliance, until their assertions are tested in the courts or prohibited by tax authorities. Furthermore, having a rule in existence does not necessarily translate into compliance by participants. For example, an investigation by the U.S. Permanent Subcommittee found that a number of audit firms were charging contingent fees in the 1990's even though Rule 302 of the AICPA's Code of Professional Conduct specifically prohibited that practice.[4] In this study, we empirically test for compliance with PCAOB Rule 3522 by identifying the existence of an upper bound in the association between auditor-provided tax services and clients' level of tax avoidance.

Tax avoidance can be viewed as a continuum beginning on one end with benign tax strategies, e.g., investment in tax-free bonds, and ending with aggressive tax strategies, e.g., tax shelters (Hanlon and Heitzman 2010). Initially, tax advisors will offer benign tax strategies, i.e.,

[4] The Permanent Subcommittee (2005) found significant disagreement within audit firms about the precise interpretation of what constitutes a contingent fee (Lennox 2016).

"low-hanging fruits." As the clients demand more tax savings, the advisor will begin to offer more complex and aggressive tax strategies, advancing along the tax continuum. For audit firms, subject to PCAOB Rule 3522, we argue there is a point where the next incremental tax strategy is too aggressive, and the firm will forego the additional revenue rather than be in breach.

Johnstone (2000) develops a model for an audit firm's decision to accept a new audit client. The author tests the model on a group of experienced audit partners. She finds that audit partners preferred an avoidance strategy for risky clients rather than compensate for the additional risk by charging higher audit fees and/or exerting more audit efforts. We posit that tax partners also follow a similar client-engagement process when considering a new tax project. We argue that tax partners prefer to forego tax-aggressive projects rather than adjust their fees. Klassen et al. (2016) interviewed a panel of tax practitioners who noted they were cognizant of the PCAOB rules and structure their tax strategies to be compliant. However, whether the majority of tax practitioners are in compliance with these rules is still an empirical question.

We proxy for the clients' level of tax avoidance using accrual-based effective tax rate (*GAAPETR*) and cash effective tax rate (*CASHETR*). Lower values for *GAAPETR* (*CASHETR*) reflect higher levels of tax avoidance (Rego 2003; Dyreng et al. 2008) and indicate more aggressive tax planning (Balakrishnan, Blouin, and Guay 2012). Prior literature documents a negative association between auditor-provided tax services (APTS) and the clients' effective tax rates (e.g., Mills et al. 1998).

Overall, our main findings support the existence of an upper boundary in the relation between APTS and clients' level of tax avoidance. We utilize quantile regressions to identify the point where the negative association between APTS and clients' effective tax rates ceases to hold. Our results indicate that the negative association between APTS and *GAAPETR*

(*CASHETR*) becomes insignificant at the 23rd (55th) percentile, which translates into a *GAAPETR* (*CASHETR*) of 16.23 percent (23.77 percent). Interestingly, beyond this percentile, we observe a positive association between APTS and *GAAPETR* (*CASHETR*) for high tax avoidance clients. We interpret this change in association between APTS and client's level of tax avoidance as evidence of the audit firms taking actions to reduce their level of tax services to tax-aggressive clients. Audit firms may also decide to reduce tax services in an attempt to avoid the perception of a lack of independence (Gul, Tsui, and Dhaliwal 2006; Krishnan, Sami, and Zhang 2005). Our findings are robust to a number of research design choices, including controlling for other determinants of tax avoidance, industry, and time-variant effects, as well as alternative measures for *APTS*.[5]

Next, we examine two major areas of concern raised by opponents to the provision of tax services. First, as consultancy and advisory services have re-emerged as the primary revenue stream for most audit firms (Statista 2019) [6], there are concerns of a return to the aggressive marketing days of the 1990s and the "potential for conflicts of interest and loss of focus on auditing" (Rapoport 2018). To address this concern, we conduct a trend analysis to examine the shift over time in the upper (lower) bound on the association between APTS and tax avoidance (effective tax rates). A downward shift in the boundary for effective tax rates would be consistent with a decline in compliance since the passage of PCAOB Rule 3522 in 2006. The trend analysis shows a monotonic downward shift, suggesting that audit firms have, over time, become more

[5] To avoid self-selection bias and maximize sample size, we measure APTS as the total fees paid by the client for all tax services. In robust checks, we rerun our analysis on a sub-sample of clients that voluntarily disclose their fees paid for tax advisory services, inferences are qualitatively similar.

[6] Fees from audit and assurance services accounted for less than 50% of the total revenue generated by all the Big-4 and second tier accounting firms in 2018.

willing to "push the envelope" on the level of tax-aggressiveness. This decline, coupled with the resurgence of consultancy services, should be an area of focus for the PCAOB.

The other major concern we address is whether audit firm's compliance with PCAOB rule 3522 varies with the level of economic bonding with the client. Opponents argue that NAS can create economic bonding between the firm and client, affecting auditor's judgment and independence (DeAngelo 1981; Kinney and Libby 2002). Economic bonding may also result in the auditor providing aggressive tax strategies in an effort to retain the client. We adopt prior studies and proxy for economic bonding using (i) the ratio of tax fees to audit fees (e.g., Lassila, Omer, Shelley and Smith 2010) and (ii) the client size (e.g., DeFond and Zhang 2014). Using the ratio of tax fees to audit fees, we fail to find evidence that audit firms are more inclined to provide aggressive tax strategies to clients with higher fee ratios (i.e. greater economic bonding). However, when we partition by the client's size, we find that the negative association between APTS and effective tax rates is more persistent for larger clients (i.e., the switch from a negative to positive association occurs at a lower level of ETR). There are at least two probable explanations for this greater persistence. The greater persistence may be an indication of an audit firm's willingness to "push the envelope" by offering more tax aggressive strategies to their larger clients in hopes of growing revenue. Conversely, larger clients have more tax planning opportunities and can therefore implement more sophisticated tax strategies, resulting in greater tax savings. Nonetheless, given the concerns about possible economic bonding, the size of a client relative to the audit office is another area of interest for the PCAOB.

Our study is relevant, timely, and provides several important contributions. First, our study provides empirical evidence of an upper bound in auditor provided tax services. When instances of tax aggressiveness occurs (e.g., Caterpillar case), a major concern among regulators

and other stakeholders is whether such incidents are a signal of a more systemic problem within the audit industry. While there is no bright-line test for compliance, we interpret the existence of an upper bound as indicative of audit firms' compliance. Whether the upper bound is at the optimal point on the tax avoidance continuum is a normative question that is best addressed by regulators, in consultation with other stakeholders.

Second, we provide empirical evidence of the effects of PCAOB regulations on the supply side of the audit industry. Prior studies have primarily focused on how companies adjusted their demand for auditor's services (audit and non-audit) post-SOX and post-PCAOB (e.g., Omer, Bedard and Falsetta 2006; Omer and Smith 2010; Maydew and Shackelford 2007), but there has been little, if any, empirical evidence on how PCAOB regulations have affected the supply side. To the best of our knowledge, this is the first study to provide empirical evidence that shows that audit firms are willing to forego revenue in order to reduce their exposures with tax-aggressive clients. For example, three Big-4 audit firms in the U.K. recently announced their decision to stop providing tax services to their client in order to avoid the perception of a lack of independence (Jones 2019).[7] Reputational and litigation risks have increased in importance, as a result of the significant penalties and fines imposed on the audit firms and its partners personally in the post-PCAOB era.[8] While the decision to engage in auditor-provided tax services is a joint function of the client and the audit firm, the *positive* association between auditor-provided tax services and the client's effective tax rates among the tax-aggressive clients is suggestive of actions taken by audit firms.[9]

[7] The U.K. operations of PWC, EY, and KPMG announced they would stop offering consulting services to their audit clients in an effort to restore public trust in auditor independence (Jones 2019).
[8] The PCAOB has the authority to investigate and discipline registered public accounting firms and persons associated with those firms for noncompliance under the Sarbanes-Oxley Act of 2002 (https://pcaobus.org/enforcement/Pages/default.aspx).
[9] If the clients are choosing not to engage the auditors for tax-aggressive strategies, the expectation would be no association between APTS and ETRs for high tax avoidance clients.

Third, we contribute to the debate on the cost-benefits of non-audit services. While there is a potential risk for economic bonding, non-audit services can provide a positive environment for knowledge spillover. Audit firms are able to acquire key insights into a client's operations, which enable auditors to provide higher audit quality, improve client financial performance, and provide relevant financial information to users (e.g., Abernathy et al. 2016; Gleason and Mills 2011; Kinney et al. 2004; De Simone et al. 2015). Prohibiting tax services or restricting accounting firms to audit-only functions, as proposed by the U.K.'s Financial Reporting Council, may have unintended consequences. Practitioners warn that restricting NAS would make auditing complex firms harder, harm talent development within the industry, and increase the cost for clients (Dancey 2018). Before placing the additional burden of new regulations on clients and practitioners, it would be prudent for authorities to assess if the existing rules are effective.

Finally, we provide empirical evidence of non-linearity in the association between auditor-provided tax services and clients' tax avoidance. Studies that rely on linear regressions (e.g., OLS), have the imbedded assumption that the relation is uni-directional throughout the distribution of the dependent variable. This assumption can be problematic and result in incorrect inferences. Quantile regression relaxes this assumption and allows for non-linearity not only in the magnitude but also in the sign of the effect at different points in the distribution. A number of contemporary accounting studies explore similar changes in the direction of association along within the distribution of the dependent variable (e.g., Hutchens, Rego and Williams 2019; Beardsley, Imdieke, and Omer 2018). These studies and ours highlight the importance for accounting researchers to consider changes in the association along the distribution of the

dependent variable. Such consideration has the potential to resolve some of the mixed evidence in the accounting literature.

2. Background and Prior Literature

2.1 Institutional Background on the Regulations of Non-Audit Services in the U.S.

The loss or impairment of an auditor's independence attributable to the provision of NAS to their clients has long been a concern for the Securities and Exchange Commission (SEC). There is some apprehension among regulators that audit firms may become economically bonded to their clients (Beck, Frecka, and Solomon 1988). Economic bonding could impair auditor's judgment or result in an environment where audit deficiencies are overlooked in order to preserve the auditor/client relationship. To improve transparency, the SEC issued Accounting Series Release (ASR) No. 250 in 1978, which required publicly traded companies to disclose NAS fees on their proxy statements. The SEC's intended the disclosure of NAS fees to provide investors with some basis to assess the potential impairment of auditor independence. However, this requirement was withdrawn in 1981 after it was concluded that investors likely had no interest in the disclosure (Glezen and Miller 1985).

In the late 1990s, the SEC had renewed concerned following significant increases in auditor-provided NAS. By 1999, NAS had grown to comprise 51 percent of public accounting fees (Byrnes, McNamee, Brady, and Lavelle 2002). In response, the SEC issued in 2000 the Revision of the Commissioners' Auditor Independence Requirements. Under this rule, audit firms are banned from providing certain NAS (e.g., bookkeeping, valuation, and actuarial services) to their publicly-listed clients. In addition, publicly-listed clients were mandated to disclose the total fees paid to their auditors categorized into fees paid for audit services, financial information systems design and implementation, and other fees.

In the wake of multiple accounting scandals, including WorldCom and Enron, the U.S. Congress passed the Sarbanes-Oxley Act of 2002 (SOX). SOX granted the SEC new enforcement powers, which resulted in the expansion of the number of prohibited NAS. The number of prohibited NAS was expanded to include internal audit service, expert services unrelated to the audit, and legal representation. In addition, all permitted NAS services has to be pre-approved by the client's audit committee.

There were significant deliberation by the SEC on whether tax services should be included on the list of prohibited NAS. The SEC found that many clients purchased tax shelters from their external auditors in the 1990's. There was concern that these tax aggressive strategies could impair auditor independence. However, in their final publication, the SEC concluded:

> The Commission reiterates its long-standing position that an accounting firm can provide tax services to its audit clients without impairing the firm's independence. Accordingly, accountants may continue to provide tax services such as tax compliance, tax planning, and tax advice to audit clients, subject to the normal audit committee pre-approval requirements under 2-01(c)(7). (SEC 2003)

As a compromise, the SEC expanded the fee disclosure requirements to include a separate category for fees paid for auditor-provided tax services.

To improve oversight of the audit industry, SOX created the Public Company Accounting Oversight Board. The PCAOB is charged with regulating public accounting firms that provide attestation services to SEC registrants. SOX authorizes the PCAOB to establish new independence standards and rules, as well as review the audits performed by public accounting firms. In 2004, the PCAOB held a roundtable to discuss auditor's independence in relation to the provision of tax services. The PCAOB had concerns that the provision of tax consultancy services had the potential to negatively impact auditor's independence (PCAOB 2004). These roundtable discussions led to three new rules to address independence concerns related

specifically to tax services. Effective from October 31, 2006, audit firms are prohibited from providing the following NAS to their publicly-listed audit clients: i) tax services on a contingent fee basis (Rule 3521), ii) tax plans that are tax aggressive or involve confidential transactions (Rule 3522), or iii) tax services to executives with financial reporting responsibilities (Rule 3523).

2.2 Impact of SOX and PCAOB Regulations on Non-Audit Services

A number of studies have examined the consequences of SOX and PCAOB's regulations and its impact on the demand for non-audit services. Omer, Bedard, and Falsetta (2006) examine the changes in the market for NAS during the legislative debate (2000-2002) by Congress on the provisions of SOX and prohibition of NAS. The authors find that during the time of the debate, clients with long-term relationships with their auditors were more likely to retain them for tax services. Similarly, Lassila, Omer, and Smith (2010) find that during the years immediately surrounding the passage of SOX, firms with more complex operations and strong corporate governance were more likely to continue to purchase tax-related NAS. Lassila et al. conclude that tax-related NAS is fundamentally different from other NAS, and that audit committees do not perceive tax-related NAS as an impairment to auditor's independence. Other studies draw similar conclusions (e.g., Kinney et al. 2004; Cook and Omer 2013).

The market for tax consultancy services showed considerable shift in demand away from the external auditor towards other third-party suppliers. Maydew and Shackelford (2007) find that the total amounts paid to external auditors for tax service fees decreased sharply between 2001 and 2004. However, total tax fees earned by public accounting firms remained consistent over the same period. These findings suggest that clients shifted their demand for tax services to other third-party accounting firms to avoid any perception of a lack of independence by their

external auditor. Lennox (2016) examines changes subsequent to the passage PCAOB regulations in 2006. He finds that clients further reduced their purchases of tax-related NAS by as much as 60 percent after the adoption of the PCAOB regulations. These studies demonstrate that changes in the regulatory environment resulted in a steep shift in clients' demand for tax services away from their external audit and towards other third party accounting firms. However, the overall market for tax consultancy services from accounting firms remained unchanged.

Despite the clients' efforts to shift tax services away from external auditors, studies on market reaction to NAS disclosure suggests that investors still perceive an impairment of auditor independence when NAS is high. Krishnan, Sami, and Zhang (2005) find that the ratio of audit to non-audit fee as well as and the level of non-audit fees are negatively associated with the earnings response coefficient (ERC). However, the negative associated occurred mainly in the second and third quarters following the release of the proxy statement. They interpret the negative association as investors' perception that NAS impaired auditor independence. Gul, Tsui, and Dhaliwal (2006) find a similar negative market reaction in the Australian market for earnings news associated with high NAS. Francis (2006) conducted a review of the extant literature on the effects of NAS on audit quality. He concludes that while the extant research suggests NAS may create the perception of reduced auditor independence "there is no smoking gun evidence linking NAS with audit failures."

There is mixed evidence in the tax literature on the association between auditor-provided tax services on clients' level of tax avoidance (tax aggressiveness). Hogan and Noga (2015) find that audit clients that purchase APTS have lower long-run effective tax rates than audit clients who did not. Likewise, Cook and Omer (2013) find that firms that dismissed their auditors as tax service providers subsequently have higher ETRs than those firms that retained their auditors for

tax services. Further, McGuire, Omer, and Wang (2012) finds that clients who purchase tax services from their auditors had even lower ETRs when the auditor is also a tax expert.[10] These studies suggest that audit clients who use their auditors for tax services achieve higher levels of tax avoidance. In contrast, Klassen, Lisowsky, and Mescall (2016) find that companies that use their auditor to prepare their tax returns are less tax aggressive (i.e., record lower contingent tax liabilties) than those that use in-house staff or a third-party provider. To provide external validity, the authors interviewed multiple tax practitioners and found that these individuals were cognizant of PCAOB prohibitions on selling tax-aggressive plans to their audit clients. These tax practitioners tailor their tax strategies to remain in compliance with PCAOB regulations and/or avoid the appearance of a lack of independence. Klassen et al. findings suggest that audit firms restrict their scope of tax services to non-aggressive strategies, consistent with the existence of an upper bound.

2.3 Non-Audit Services and Audit Quality

The effect of NAS on audit quality and the clients' financial performance is well studied in the tax literature. Gleason and Mills (2011) investigate whether tax-related NAS impairs auditor independence. To the contrary, they find that tax-related NAS improves estimates for tax reserves and does not result in increased misstatements. Kinney, Palmrose, and Scholz (2004) study the separate effects of tax-related NAS and other NAS on audit quality. They conclude that clients who purchase tax-related NAS (other NAS) are less (more) likely to have financial misstatements. Cook and Omer (2013) also find that the likelihood of financial restatements did not change for clients that discontinued procuring tax services from their auditor. De Simone, Ege, and Stomberg (2015) examine the impact of tax-related NAS on internal controls and find

[10] They measure tax expertise based on the firm's annual market share in a given industry and metropolitan statistical area.

that companies that purchase tax-related NAS are significantly less likely to disclose material internal control weaknesses. Overall, these studies fail to find evidence that tax-related NAS impairs auditor independence. Instead, some of these findings suggest tax-related NAS improves audit quality, which they attribute to knowledge spillover from the tax services. Alternatively, the findings from these studies can be interpreted as auditors being less likely to demand restatements or issue adverse internal control opinions when tax-related NAS is high (Harris and Zhou 2013). Therefore, the effect of tax-related NAS on audit quality is not conclusive.

Other studies that focus on earnings management find that tax-related NAS can lead to economic bonding and impair auditor independence. Cook, Huston, and Omer (2008) examine the relation between tax-related NAS and earnings management. They find that higher APTS fees are associated with a greater reduction in clients' effective tax rates for third and fourth quarter earnings releases. Conversely, clients who did not purchase APTS did not experience a similar reduction in their ETRs. The authors view the reduction in ETRs as evidence of increased earnings management opportunities for clients that purchased tax-related NAS and opine that further regulatory restrictions on tax-related NAS may improve audit quality.

Lennox (2016) investigates the impact of the passage of the PCAOB regulations (specifically Rules 3521, 3522, and 3523 that restricted APTS) on audit quality. The author identifies his treatment group as companies that had a significant drop in APTS after the introduction of the restrictions. Using accounting and tax-specific misstatements as well as going concern opinions as proxies for audit quality, he does not find a significant change in audit quality post-implementation. He concludes that the PCAOB restrictions on tax-related NAS did not improve audit quality. However, this study does not address whether the absence of an

improvement in audit quality stems from a lack of compliance with the PCAOB rules. In our study, we specifically look for evidence of compliance.

While there has been significant research into the effects of SOX and PCAOB regulations on the demand for tax services, clients' level of tax avoidance, and impact on audit quality, based on our research, there have been no empirical study on the supply-side effects of PCAOB regulations. Audit firms compliance with PCAOB regulations on the prohibition of aggressive tax strategies is largely assumed but untested in the extant literature. Our study contributes to this literature by specifically testing for audit firms' compliance with PCAOB's restrictions on tax services.

3. Hypothesis Development

Hanlon and Heitzman (2010) argues that tax avoidance can be viewed as a continuum beginning with benign tax strategies, e.g., investment in tax-free bonds, at one end and aggressive tax strategies, e.g., tax shelters, at the other extreme. Tax advisors will first offer their clients benign strategies to reduce their taxes, i.e., the "low-hanging fruits". After these benign strategies have been exhausted, tax advisors will have to develop more costly and complex tax strategies to achieve higher levels of tax avoidance, each new strategy increasingly more aggressive. Consistent with tax aggressiveness increasing along the continuum, Dyreng, Hanlon, and Maydew (2019) finds that tax uncertainty, proxied by unrecognized tax benefits, increases with tax avoidance.

In the case of tax advisory services, we argue that there should exist a point where the next incremental tax strategy is too aggressive for the audit firm to provide that incremental strategy without breaching PCAOB Rule 3522. Klassen et al. (2016) note that tax partners are cognizant not to provide tax-aggressive strategies to their audit clients. We consider this point to

be an upper boundary, "a line in the sand", in the scope of tax strategies that audit firms can supply to their audit clients.[11] If audit firms are in compliance with PCAOB Rule 3522, then there should exist an upper boundary in the association. We, therefore, make the following prediction:

H1*: There exists an upper boundary in the relation between auditor-provided tax services and clients' tax avoidance.*

Audit firms exercise choice in their acceptance of a new client or performance of additional services to their existing clients. However, little is known about the client engagement process. Johnstone (2000) develops a model for an audit firm's client-acceptance decision based on an evaluation of client-related risks and the likelihood of future litigation. The author tests the model using 137 highly experienced audit partners as participants. She finds that auditors chose to avoid risky clients rather than adjust their audit fees or audit effort to adapt to the increased risk. We posit that tax partners follow a similar client-engagement review process and prefer to forego risky tax engagements rather than adjust their fees to account for the additional risk.

4. Research Methodology

4.1 Measures of Tax Avoidance and Auditor-Provided Tax Services

In our analysis, we use two measures for tax avoidance: the book effective tax rate (*GAAPETR*) and the cash effective tax rates (*CASHETR*). Prior empirical studies have used a wide variety of proxies for tax avoidance (Hanlon and Heitzman 2010; Blouin 2014), most of these proxies focus on specific forms of tax planning, e.g., i) aggressive tax planning

[11] PCAOB Rule 3522 only applies to clients registered with SEC, i.e., public-listed audit clients. The upper boundary does not result from a limitation on audit firms' ability to design and implement aggressive tax strategies. As noted in a report by the Government Accountability Office (GAO 2005), many clients purchased tax shelters from their external auditors in the 1990's. Post PCAOB, audit firms are not prohibited from marketing tax-aggressive strategies to public-listed companies that they do not audit or private companies (whether or not they are audit clients).

(unrecognized tax benefits and likelihood of tax shelter participation); ii) segmented tax planning (permanent/deferred taxes, domestic/foreign ETRs); or iii) discretionary tax planning (DTAX). The two measures we select have the advantage of capturing tax avoidance along the full tax continuum, which is consistent with our research interest.

GAAPETR is calculated as total tax expense (TXT) divided by pre-tax book income less special items (PI – SPI). Previous studies show that managers and investors focus on *GAAPETR* as the primary measure of performance for firms' tax strategy (Rego 2003; Graham et al. 2012). While *GAAPETR* reflects the tax savings from permanent tax strategies, it does not capture tax savings from deferral or uncertain tax strategies.[12] Hence, we use *CASHETR* to capture tax savings from permanent and deferral tax strategies as well as uncertain tax positions (Dyreng et al. 2008; Blouin 2014). *CASHETR* is calculated as cash taxes paid (TXPD) divided by pre-tax book income less special items (PI – SPI). Lower values for *GAAPETR* (*CASHETR*) reflect higher levels of tax avoidance (Rego 2003; Dyreng et al. 2008). Balakrishnan, Blouin, and Guay (2012) define a tax-aggressive entity as one that pays an unusually low amount of tax given the entity's industry and size. We adopt their definition and interpret low levels of *GAAPETR* (*CASHETR*) as indicative of aggressive tax planning.

To measure auditor-provided tax services (APTS), we follow prior research and use total tax fees paid to proxy for tax advisory services (e.g., Lennox 2016; McGuire et al. 2012; Gleason and Mills 2012, Mills et al. 1998). Total fees paid are disclosed in clients' proxy statements and 10K filings, and are also available in machine-readable format from the Audit Analytics database. Klassen et al. (2016) investigate the association between total tax fees paid to the auditor and the

[12] Under FIN 48 guidelines, Accounting for Tax Uncertainty, companies should record a tax reserve for tax positions that are less likely than not to be sustained under a tax audit, i.e., aggressive tax strategies. Hence, tax savings from aggressive tax strategies would not be reflected in *GAAPETR*, provided companies apply the FIN 48 rules appropriately.

individual who signs as preparer on the corporate tax return. They find that 81 percent of their sampled companies purchased some form of APTS, but only 20 percent had the auditor sign as the preparer on their tax return. Their finding suggests that the total tax fees paid are more likely to reflect tax advisory services than tax compliance. They conclude that total tax fees paid is an acceptable proxy for tax advisory services. Nonetheless, in robust tests, we utilize a sub-sample of clients that voluntarily disclose their tax advisory fees (See Section 5.3 for discussion of results).

4.2 Empirical Model

To test our hypothesis, we rely on quantile regressions to detect the upper (lower) boundary in the association between APTS and clients' level of tax avoidance (effective tax rates). While classical linear regression techniques (e.g., ordinary least squares), summarize the average relationship between the regressor(s) and the response variable, quantile regressions allow us to exam the relationship at different points in the conditional distribution of the response variable (Koenker and Hallock 2001). In the cases where interest lies in the regions of the conditional distribution, quantile regressions provide a more detailed analysis of the association than the classical linear models (Waldmann 2018). In addition, quantile regressions are more robust to influential observations and outliers in the response variable (Koenker 2005; Leone, Minutti-Meza, Wasley 2019).

We begin our test of H1 using the following quantile regression:

$$TaxAvoidance_{it} = \alpha_0 + \beta_1 LogAPTS_{it} + \varepsilon_{i,t} \qquad (1)$$

The dependent variable, *Tax Avoidance*, is represented in equation (1) by one of our two proxies (*GAAPETR* and *CASHETR*). Our regressor is total tax fees paid by the client in year *t*. Following prior research (e.g., Mills et al. 1998; Hogan and Noga 2015), we take the natural log of APTS (*LogAPTS*) to control for skewness in the distribution of APTS fees. Consistent with prior

studies, we expect the upper-section of the distribution for *GAAPETR* (*CASHETR*), i.e., low-tax avoidance firms, to be negatively associated with *LogAPTS* ($\beta_1 < 0$). However, consistent with H1, we expect the magnitude of the association to diminish and eventually lose statistical significance as the client moves along the tax continuum and passes the threshold of tax aggressiveness ($\beta_1 = 0$). In other words, we expect APTS to be a driver of clients' tax avoidance up to the point where strategies become tax aggressive, beyond that point any further decline in ETRs is not the result of APTS.

We also use a two-step multivariate regression design to control for other determinants of tax avoidance that may be correlated with APTS. We first regress our measures of tax avoidance (*GAAPETR* and *CASHETR*) on other known determinants that prior studies have shown to be correlated with APTS (e.g., Mills et al. 1998; Rego 2003; Chen et al. 2010; McGuire et al. 2012). Second, we insert the estimated residuals ($\hat{\delta}_{it}$) from the first regression as our dependent variable in our quantile regression. This two-step approach allows us to hold the other determinants constant while allowing the coefficient on the variable of interest (*LogAPTS*) to vary across the conditional distribution of the response variable.[13] The multivariate and quantile regressions are represented as follows:

$$\begin{aligned} TaxAvoidance_{i.t} = \; & \alpha_0 + \gamma_1 SIZE_{i.t} + \gamma_2 FI_{i.t} + \gamma_3 LEV_{i.t} + \gamma_4 PPE_{i.t} + \gamma_5 R\&D_{i.t} \\ & + \gamma_6 DEP_{i.t} + \gamma_7 BTM_{i.t} + \gamma_8 EQINC_{i.t} + \gamma_9 PT_{ROA_{i.t}} + \gamma_{10} NOL_{i.t} \\ & + \gamma_{11} \Delta NOL_{i.t} + \gamma_{12} CASH_{i.t} + \gamma_{13} ABACC_{i,t} \\ & + \gamma_J IndustryFE_{i.t} + \gamma_K YearFE_{i.t} + \delta_{i,t} \qquad (2) \end{aligned}$$

[13] In an earlier version of the paper, we divided the sample into quartiles based on the level of tax avoidance and ran a single OLS regression, with controls, within each quartile. We found a negative mean effect for the middle two quartiles and a positive mean effect for the lowest quartile (high tax avoidance clients), consistent with the results from our quantile regressions. We switched to the quantile regression because it allows us to identify the point where the direction of association changes.

$$\hat{\delta}_{it} = \alpha_0 + \beta_1 LogAPTS_{it} + \varepsilon_{i,t} \quad (3)$$

In equation (2), we control for the client's economies of scale, complexity, opportunities and incentives to avoid income taxes and their financial reporting aggressiveness. We control for the client's economies of scale and complexity using firm size (*SIZE*), income from foreign operations (*FI*), leverage (*LEV*), capital intensity (*PPE*), mobile income (proxied by *R&D*), depreciation expenses (*DEP*), growth opportunities (*BTM*), and income related to the equity method (*EQINC*). The clients' opportunities and incentives to avoid income taxes are proxied using client's profitability (*PT_ROA*), tax-loss carryforwards (*NOL),* change in *NOL* (*ΔNOL*), and cash balance (*CASH*). Next, we control for the clients' financial reporting aggressiveness, using abnormal accruals (*ABACC*). Frank et al. (2009) finds that companies that are aggressive for financial reporting purposes also tend to be tax aggressive. Lastly, we include year and industry (2-digit SIC) fixed effects and cluster standard errors by clients. Definitions for all variables are listed in Appendix A.

4.3 Sample Selection and Descriptive Statistics

Our sample selection begins with all observations in the Audit Analytics (AA) database for the fiscal years 2002 thru 2016, which is the timeframe attributable to major regulations restricting NAS.[14] Audit Analytics provide information on the annual fees paid to external auditors by all SEC registrants. In refining our sample, we eliminate all non-U.S. companies since we are interested in the effect of PCAOB regulations on U.S. businesses. Consistent with prior research, we also exclude clients that are registered as mutual funds, trusts, limited partnerships, or other flow-through entities, as these business entities have different tax planning

[14] We begin the sample period in 2002 because of the restrictions on NAS services that were first introduced in the Sarbanes-Oxley Act of 2002, followed by the publication of the detailed rules and regulations by the PCAOB in 2006. Our main results are not sensitive to beginning the sample period in the post PCAOB period (i.e., 2006-2016). We will discuss time trends in our cross-sectional analyses (see Section 5.4).

opportunities and incentives from C-corporations (e.g., McGuire et al. 2012). We further restrict our sample to the original financial statements released by the firms (i.e., RESTATEMENT=0). These initial filters result in a sample of 161,419 client-year observations.

Next, we cross-match our AA sample with available financial statement data obtained from the Compustat's annual database. We eliminate observations that do not have a match or the necessary data to calculate our dependent or independent variables in Equations (1) through (3). We also exclude client-year observations with negative pre-tax income to ensure that any loss of association among low-ETR clients is not driven by loss-making clients that lack demand for tax advisory services. Finally, as our focus is on the change in association conditional on clients purchasing tax services from their external audit firm, we also exclude client-year observations with no tax service fees paid to the external auditor. [15] These requirements result in a final sample of 20,423 client-year observations. Table 1 summaries the sample selection process.

Table 2 presents the descriptive statistics for our sample. The mean (median) amount spent for auditor-provided tax services (APTS) is $388,000 ($119,000), which is significantly less than the $2.315M ($1.150M) spent for audit services.[16] Clients that purchase tax services from their auditor have a mean (median) *GAAPETR* of 28.11 (30.87) percent and a mean (median) *CASHETR* of 23.63 (21.41) percent. The lower values for *CASHETR* reflect the additional tax savings from deferral and uncertain tax positions not captured in *GAAPETR*. Overall, the descriptive statistics are consistent with prior literature (e.g., McGuire et al. 2012).

[15] For completeness, in robust test, we include clients that report zero values for APTS and our inferences are qualitatively similar.

[16] We include audit fees in Table 2 for comparison purposes, but do not consider it a determinant of tax avoidance in Equation (2).

Table 3 presents the Pearson (Spearman) correlation matrix in the upper (lower) diagonal for the variables in our models. For brevity, we will only discuss the Spearman correlations. *GAAPETR* is negatively correlated with *LogAPTS*, which suggests that the mean effect of purchasing auditor-provided tax services is greater tax avoidance (Mills et al. 1998). However, the correlation between *CASHETR* and *LogAPTS* is positively and statistically significant.[17] The correlations between the tax avoidance proxies and the other tax determinants are, in general, consistent with prior studies (see Hanlon and Heitzman 2010 for a summary of the determinants of tax avoidance). We also observe significant correlations between *LogAPTS* and a number of the determinants. This is not surprising as these determinants are often the vehicles through which the audit firms implement their tax strategies (e.g., income-shifting through foreign operations (*FI*), mobile assets (*R&D*), and debt-financing (*LEV*)).

Figure 1 presents scatterplot graphs of the association between APTS and clients' tax avoidance. In Panel A, the scatterplot has *GAAPETR* on the y-axis and *APTS* (in millions) on the x-axis. The contour of the graph indicates a negative association between *GAAPETR* and *APTS*, consistent with prior studies. However, the graph indicates that the negative association diminishes, eventually becoming asymptotic with the x-axis around the 20 percent GAAPETR line. This pattern is be consistent with our expectation from H1 of a lower (upper) bound in the association between APTS and effective tax rates (tax avoidance). In Panel B, we mean-adjust *GAAPETR* by industry (based on two-digit SIC) and fiscal year to control for heteroscedasticity differences across industries and time (Dyreng et al. 2008; Balakrishnan et al. 2012). The revised

[17] In untabulated analysis, we obtain a negative and significant correlation between *LogAPTS* in year *t* and *CASHETR* in year *t+1*. This lagged correlation suggests that while tax savings from APTS are reflected in current year earnings, the cash tax savings may not materialize until the following fiscal year when the tax return is filed and final payment made (refund obtained). In robustness tests, we rerun our analysis using long-run (3-year) measures for *LogAPTS* and *CASHETR (GAPPETR).* See discussion of robustness test in Section 5.3.

graph continues to show a lower bound in the negative association between APTS and effective tax rates. In addition, the lowest quartile of mean-adjusted *GAAPETR* shows signs of a positive association with APTS.[18] Overall, Figure 1 provides visual evidence of lower bound, in support of H1, and indicates potential non-linearity in the relation between APTS and tax avoidance.

5. Results

5.1 Quantile Regressions

The results of the quantile regression of *GAAPETR* on *LogAPTS* from Equation (1) are presented in Panel A of Table 4. We tabulate the estimated GAAPETR, coefficients, and standard error for the 10^{th} – 90^{th} percentile, in five percentile point increments. We also insert the line graph of the coefficients with the 95% confidence interval. The table shows negative and statistically significant coefficients for the 90^{th} percentile down to the 25^{th} percentile. A breakdown of the 20^{th} – 25^{th} percentile shows that the statistical significance stops at the 23^{rd} percentile, which translates into a *GAAPETR* of 16.23 percent. The loss of statistical significance is consistent with H1 – the existence of an upper (lower) bound in the relation between APTS and tax avoidance (effective tax rates). Interestingly, we observe positive and statistically significant coefficients for the 10^{th} – 18^{th} percentile. The positive coefficients indicate that APTS levels are declining for high tax-avoidance clients and suggest any additional tax avoidance is attributable to other factors (e.g., third party tax advisors or in-house specialists), not APTS.

We report the results for the quantile regressions with *CASHETR* as the dependent variable in Panel B of Table 4. We observe a similar non-linear pattern as in Panel A with negative (positive) coefficients for *LogAPTS* for low (high) tax-avoidance clients. The negative coefficients loss statistical significance at the 53^{rd} percentile (CASHETR of 23.77 percent) and

[18] We construct a similar scatterplots for *CASHETR* and observe qualitatively similar patterns; for brevity we exclude the scatterplots from the paper.

the coefficients turn positive and statistically significant at the 45th percentile. The positive coefficients suggest audit firms are not only comply with PCAOB Rule 3522 but also reduce their tax services to high tax-avoidance clients. Possibly to avoid the perception of being the source of these clients' aggressive tax strategies (Francis 2006; Gul et al. 2006; Krishnan et al. 2005). Alternatively, it is possible that as the clients become more tax aggressive, they opt for third-party providers or in-house tax planners as these sources are not constrained by PCAOB Rule 3522 (Klassen et al. 2016). However, if clients are opting to other providers then the levels of APTS should hold constant, not reduce, and we should not observe a positive association.

5.2 Two-Step Multivariate Regressions

Next, we repeat our analyses using two-step multivariate regressions to control for other known determinants of tax avoidance that may be correlated with *LogAPTS* (i.e., the omitted variable problem). In columns (1) and (2) of Table 5, we present the results of our estimates of Equation (2) with *GAAPETR* and *CASHETR* as the dependent variable, respectively In general, the coefficients are consistent with prior studies. We find that clients with higher levels of foreign income (*FI*), leverage (*LEV*), tax losses (*NOL*), more mobile income (*R&D*), greater complexity (*EQINC*), and more cash resources (*CASH*) have lower effective tax rates (i.e., higher levels of tax avoidance). In addition, clients that are aggressive for financial reporting (ABACC) tend to have higher levels of tax avoidance (Frank et al. 2009). Conversely, larger clients (*SIZE*) are associated with higher effective tax rates (i.e. lower tax avoidance), consistent with the political cost hypothesis (Rego 2003). Greater capital intensity (*PPE*) is associated with lower *CASHETR*, but not *GAAPETR*, because capital expenditures result in deferred tax savings.

To compare our setting with prior studies (e.g., Mills et al. 1998), we include *LogAPTS* as a regressor in columns (3) and (4) of Table 5. Results show negative coefficients for *LogAPTS*,

which is consistent with prior literature and shows that the *mean* effect of higher levels of APTS is greater tax avoidance.

Table 6 reports the results of the quantile regressions for Equation (3) with the estimated residuals from Equation (2) as the dependent variable. Panel A (Panel B) presents the coefficients when the residuals are based on *GAAPETR* (*CASHETR*). Consistent with our results from Table 4, we continue to observe a non-linear pattern with negative (positive) coefficients for *LogAPTS* for low (high) tax-avoidance clients. Interestingly, after controlling for correlated determinants of tax avoidance, we observe little change in the estimated boundary point for either specification (21st percentile for *GAAPETR* and 53rd for *CASHETR*). Overall, the results in Table 6 are consistent with our hypothesis of an upper boundary point in the positive association between auditor-provided tax services and tax avoidance.

5.3 Robustness Tests

To ensure the robustness of our findings, we conduct a number of additional tests. First, we use long run (three-year) measures for our dependent and independent variables. Tax planning is often complex and involves a number of different steps that take time to implement and materialize. Thus, our contemporaneous measures may fail to match the cost of the tax strategy (*LogAPTS*) with the associated benefits (reduction in ETR). If the mismatch between cost and benefits is concentrated among the high tax avoidance clients, then this could explain the absence of a negative association within this group. To address these concerns, we re-run our analyses using long-run (three-year) measures of ETRs (year *t* thru to *t+2*).[19] For brevity, we do

[19] For the long-run test, we use three-year cumulative rolling measures for *GAAPETR* and *CASHETR*, following the methodology presented in Dyreng et al. (2008). For the regressors, if the variable is a ratio, the three-year measure is constructed similar to that for GAAPETR – the sum of the numerator for the years *t* thru *t+2* divided by the sum of the denominator for the years *t* thru *t+2*. For all other regressors, the three-year measure is a simple rolling average for the year *t* thru *t+2*.

not tabulate our results. Our results are qualitatively similar and continue to show an upper bound to the negative association between *LogAPTS* and ETRs.

Second, as our main analyses use total tax fees paid as our proxy for tax advisory fees, we cannot rule out the possibility that tax compliance fees heavily influence the results. To address this identification problem, we utilize a sub-sample of clients that voluntarily disaggregate their total tax fees paid into compliance and advisory fees and rerun our test of H1 on each measure independently. The sub-sample consists of 1,086 client-year observations concentrated in fiscal years 2009 to 2016. The results for the quantile regressions are presented in Figure 2. Column (1) reports the results for the log of total tax fees paid (*LogAPTS*), Column (2) tax advisory fees, and Column (3) tax compliance fees. All three columns present similar findings to those in Table 4 with a negative association that turns positive for high tax avoidance clients. These results suggest that audit firms are not only compliant with PCOAB rules on tax-aggressiveness, but they are also apprehensive about the perception that providing large amounts of tax services to high tax avoidance clients can create (Gul et al. 2006; Krishnan et al. 2005).

5.4 Cross-Sectional Analyses

To address specific areas of concern raised by opponents of non-audit services, we conduct cross-sectional analyses to analyze the validity of their arguments. First, we examine whether compliance with PCAOB Rule 3522 has deteriorated over time. Our sample period begins in 2002, immediately after the passage of the Sarbanes-Oxley Act and extends over fifteen years. PCAOB Rule 3522 was introduced in 2006, and there has been a number of changes in the audit and tax advisory services market with the resurgence of consultancy as the major revenue stream for the Big4 and second tier audit firms, accounting for over 50% in 2018

(Statista 2019).[20] In fact, many of these firms now refer to themselves as professional service firms, which reflects the diversification of their service lines. This revival of consultancy services has raised concerns of a return to the aggressive marketing days of the 1990s and a "potential for conflicts of interest and loss of focus on auditing" (Rapoport 2018; Agnew 2015). This shift in revenue sources could diminish the audit partner's influence in the oversight of the client-engagement process for tax services, resulting in weakened compliance with PCAOB Rule 3522.

We conduct a trend analysis to examine whether the lower bound in the negative association between APTS and client effective tax rates has shifted during our sample period. We adopt the partition design from Lennox (2016) and divide our sample into windows spanning approximately three-years: i) Pre-PCAOB (Jan 1, 2002—July 26, 2005), ii) Post PCAOB I (Oct 06, 2006—Dec 31, 2009), iii) Post-PCAOB II (Jan 1, 2010—Dec 31, 2012), and iv) Post PCAOB III (Jan 1, 2013—Dec 31, 2016).[21] We then run quantile regressions within each window. If audit firms are "pushing the envelope" in advising their clients with tax aggressive services, then we expect a leftward shift in the lower bound in the negative association between APTS and effective tax rates.

The coefficients from the quantile regressions are presented in the linear graphs in Figure 3. Panel A (Panel B) reports the results with *GAAPETR* (*CASHETR*) as the dependent variable. Both panels show a leftward shift in the lower bound of the negative association between LogAPTS and effective tax rates. An (untabulated) analysis of the 95% confidence interval for

[20] In the wake of the Enron accounting scandal, many accounting firms divested their consulting arms and signed non-compete agreements. By the late 2000s, these non-compete agreements had expired (Agnew 2015).
[21] To mitigate misidentification error, Lennox (2016) excludes fiscal years beginning or ending in the "transition" window – the period between the announcement of Rule 3522 on July 26, 2005 and its effective date of October 31, 2006.

each window shows that the threshold for Post PCAOB III is significantly lower than the threshold for the Pre-PCAOB period. This monotonic leftward shift suggest that, over time, auditors are embolden to provide more aggressive strategies to retain their clients and grow revenue or to push the envelope to see how far they are able to go within the confines of the PCAOB rules. [22] This trend provides empirical evidence for the concerns of a 'lack of compliance' and a possible return to the aggressive marketing days of the 1990s.

Next, we examine whether economic bonding makes audit firms more inclined to provide tax-aggressive strategies to their clients. Economic theory suggests that auditors' incentives to compromise their independence are linked to the client importance (DeAngelo 1981). We adopt two alternate proxies for economic bonding from prior studies, i) the ratio of tax advisory fees to audit fees (*BONDING*) and ii) client size (*SIZE*). A number of prior studies use *BONDING* to capture the relative importance of tax fees to audit fees (e.g., Krishnan, Sami, Zhang 2005, Lassila et al. 2010). The larger the ratio, the greater the economic bonding and likelihood that the audit firm may push the envelope on tax-aggressiveness. Other prior studies argue that it is the level of fees or the size of the client, rather than ratio that leads to economic bonding (Carson et al. 2013; DeFond and Zhang 2014). The larger the client, the more potential revenue can be generated. Since *LogAPTS* is our variable of interest, we partition on client size rather than the level of tax fees paid.

To facilitate easier interpretation of the results, we split the sample into two groups based on whether the client is above or below the median value for *BONDING* (*SIZE*) within each fiscal year. We then run quantile regressions within each group. The linear graphs of coefficients from the results are presented in Figure 4. Panels A (Panel B) of Figure 4 maps the results of the

[22] A online search of PCAOB's annual enforcement orders failed to find any case of an audit firm or partner being sanctioned for violating PCAOB Rule 3522 (https://pcaobus.org/Enforcement/Decisions/Pages/default.aspx).

quantile regressions with *GAAPETR* (*CASHETR*) as the dependent variable and *BONDING* as the partition variable. Both graphs suggest that higher economic bonding is associated with more aggressive tax planning (i.e., a shift of the curve to the left). However, an analysis of the 95% confidence intervals fails to find significant statistical differences between high *BONDING* and low *BONDING* clients in both graphs.[23]

Panels C and D of Figure 4 maps the results of the quantile regressions with *SIZE* as the partition variable. In Panel C, where *GAAPETR* is the dependent variable, we observe a lower bound for smaller clients at 17.11 percent *GAAPETR*, similar to the pattern in our main results. However for larger clients, there is no evidence of a lower bound as the coefficient is negative throughout the distribution of *GAAPETR*. In Panel D, where *CASHETR* is the dependent variable, we find evidence of a lower bound for both smaller and larger clients, but with a lower (and statistically significant, *p*-value <0.05) threshold for larger clients. Overall, the results in Panel C and D suggest the negative association between APTS and effective tax rates is more persistent for larger clients. This finding is consistent with audit firms "pushing the envelope" and being more aggressiveness with the tax strategies they offer to their larger clients, possibly in the hopes of growing revenue, consistent with economic bonding. Alternatively, the greater persistence may be the result of larger clients having more tax planning opportunities and ability to implement sophisticated tax strategies, leading to greater tax savings. Nonetheless, given evidence of possible economic bonding, the size of a client, especially relative to the audit office, should be an area of interest for the PCAOB.

[23] In robustness tests, we measure economic bonding as the ratio of total non-audit fees to audit fees (Krishnan et al. 2005), and the ratio of other non-audit fees (i.e. total non-audit fees – tax fees) to audit fees (Lassila et al. 2010). We do not find significant differences between low *BONDING* and high *BONDING* clients using either measure.

6. Conclusion

In this study, we investigate U.S. audit firms compliance with PCAOB Rule 3522. We determine compliance by using quartile regressions to identify the upper bound in the association between auditor-provided tax services and clients' level of tax avoidance. While the extant literature has studied the consequences of PCAOB regulations, these prior studies make the implicit assumption that audit firms are compliant. However, anecdotal incidents of tax aggressiveness, as well as the resurgence of consultancy and advisory services as the main revenue source for audit firms, have raised concerns of a compliance problem.

Consistent with our hypothesis, we find empirical evidence of an upper (a lower) boundary in the positive (negative) association between APTS and clients' tax avoidance (effective tax rates). We interpret the presence of an upper bound as evidence of audit firms' compliance with PCAOB 3522. Moreover, we observe a negative association between APTS and clients' tax avoidance for high tax avoidance clients. The positive association suggests audit firms take real economic decisions to forego revenue in order to avoid the perception of being the source of clients' tax-aggressive. By reducing their exposure the audit firms their regulatory and litigation risks of being accused of facilitating their clients' aggressive tax behavior.

Time trend analyses shows an upward shift in the upper bound on the positive association between APTS and clients' tax avoidance in the years following the introduction of PCAOB Rule 3522 in 2006. This shift suggests that audit firms are providing more tax aggressive strategies to their audit clients, potentially attributable to the resurgence of consultancy and advisory services, signaling a return to the aggressive marketing days of the 1990s. In cross-sectional analyses, we find some evidence of economic bonding. We observe that the upper bound is at a higher position for larger clients. This finding suggest that audit firms are willing to

"pushing the envelope" for larger clients, possibly to retain clients and grow future revenue. Overall, the cross-sectional results suggest that while there is evidence of compliance, audit firms are gradually providing more tax-aggressive strategies and are more willing to facilitate tax avoidance for larger clients.

Collectively, the results of our study should be of interest to the PCAOB as it provides broad empirical evidence on the effectiveness of current regulations on tax advisory services to audit clients. Additionally, the finding of non-linearity between APTS and tax avoidance has important implications for future academic research on the external auditor's role in clients' tax planning strategies. Researchers need to be cognizant that the association between APTS and tax avoidance is conditional on whether the client is a high- or low-tax avoider.

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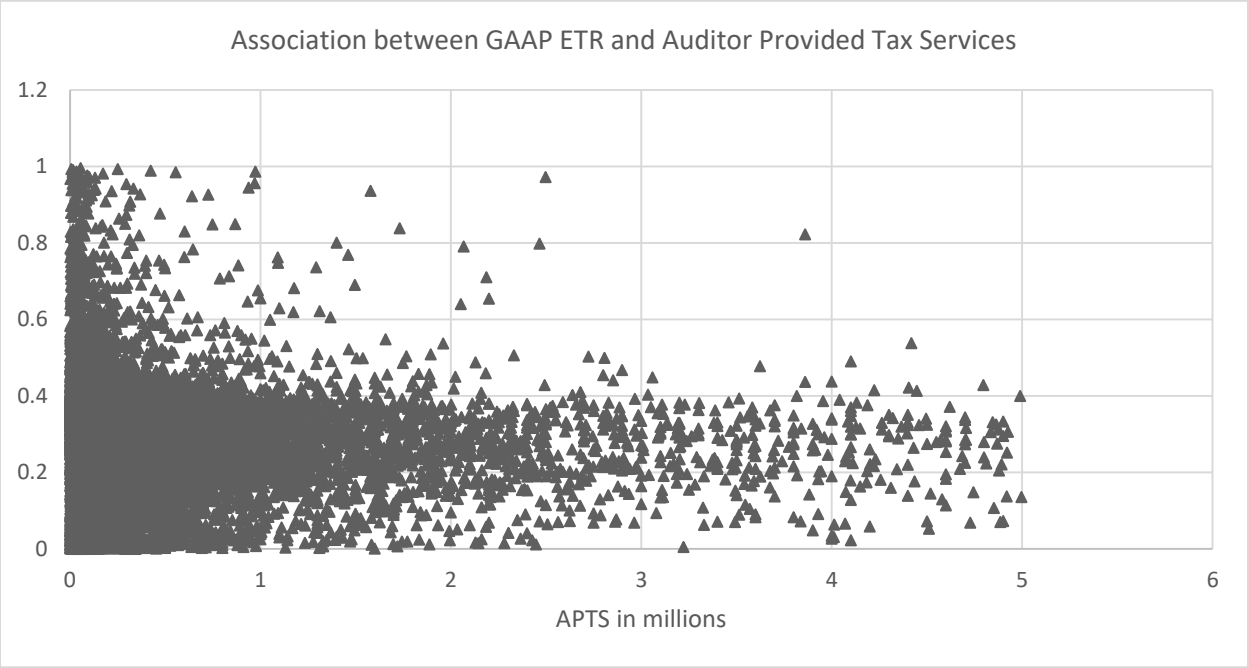
Appendix A
Variable Definitions

Measures of Tax Avoidance	
GAAPETR	Effective tax rate is defined as total tax expense (TXT) divided by pre-tax book income less special items (PI - SPI). ETRs with negative denominators are deleted. The remaining non-missing ETRs are winsorized at 0 and 1.
CASHETR	Cash effective rate is defined as cash taxes paid (TXPD) divided by pre-tax book income less special items (PI - SPI). CASHETRs with negative denominators are deleted. The remaining non-missing CASHETRs are winsorized at 0 and 1.
Independent Variables	
ABACC	Abnormal accruals based on the performance-adjusted modified Jones Model, computed using all available Compustat U.S. companies.
BTM	Book-to-market ratio at the end of the year, measured as book value of equity (CEQ) divided by market value of equity (PRCC_F x CSHO).
CASH	Cash holding at the end of the year (CHE) divided by total assets at the beginning of the year (AT).
DEP	Depreciation and amortization expense for the year (DP) divided by total assets at the beginning of the year (AT).
EQINC	Equity income (ESUB) scaled by total assets at the beginning of the year (AT).
FI	Pre-tax foreign income (PIFO) scaled by total assets at the beginning of the year (AT).
LEV	Long-term debt at the end of the year (DLTT) scaled by total assets at the end of the year (AT).
LogAPTS	The natural log of (1+ TAX_FEES), in millions. Source: Audit Analytics.
LogAuditFees	The natural log of (1+ AUDIT_FEES), in millions. Source: Audit Analytics.
NOL	Indicator variable equal to 1 if there is a positive tax-loss carryforward amount (TLCF > 0) at the end of the year; 0 otherwise.
ΔNOL	Change in tax-loss carryforward (TLCF) from year *t -1* to *t,* scaled by total assets at the beginning of the year (AT).
PPE	Net property, plant and equipment at the end of the year (PPENT) scaled by total assets at the beginning of the year (AT).
PT_ROA	Pre-tax return on assets, measured as the ratio of pre-tax income (PI) to total assets at the beginning of the year (AT).
R&D	Research and development expenses (XRD) scaled by total assets at the beginning of the year (AT).
SIZE	Natural log of market value of equity (PRCC_F x CSHO) at the beginning of the year.

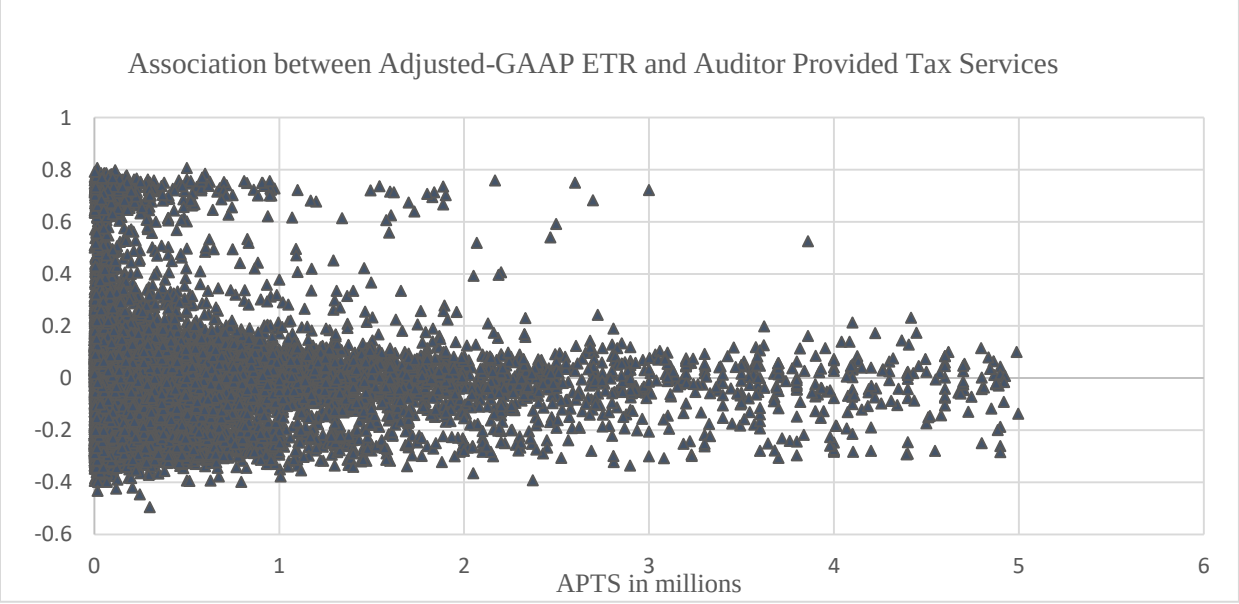
Unless otherwise stated, data is sourced from Compustat's Fundamentals Annual Database.

Figure 1

Panel A



Panel B



The scatterplots above present the association between fees paid for auditor-provided tax services (APTS) and clients' GAAP effective tax rates (*GAAPETR*). In Panel B, the effective tax rates are mean-adjusted by industry and year to control for heteroscedasticity among the observations. Both panels indicate a non-linear pattern in the association between the two variables. Note, GAAP ETRs above 1 and below 0 have been truncated. APTS is winsorized at the 1st and 99th percentile. Variables are defined in Appendix A.

Figure 2
Quantile Regressions of Tax Avoidance on Fees Paid for Auditor-provided Tax Services

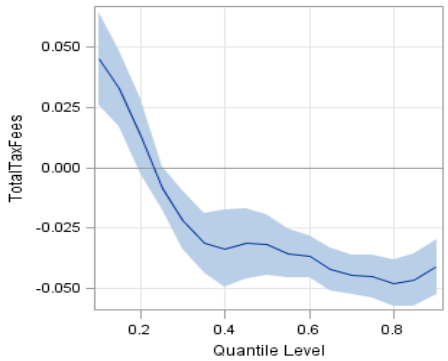
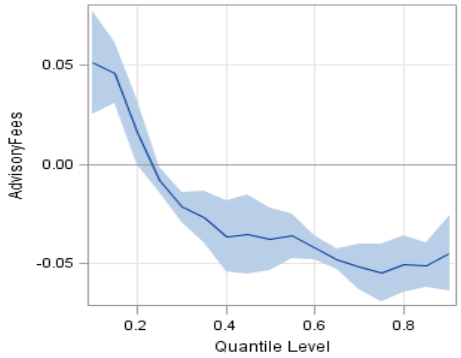
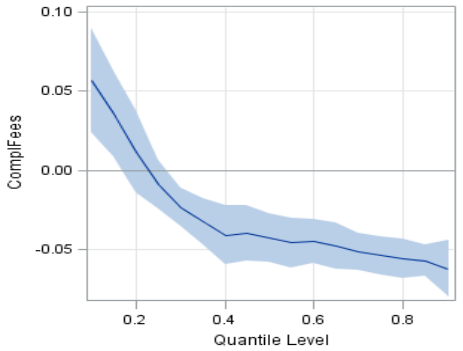
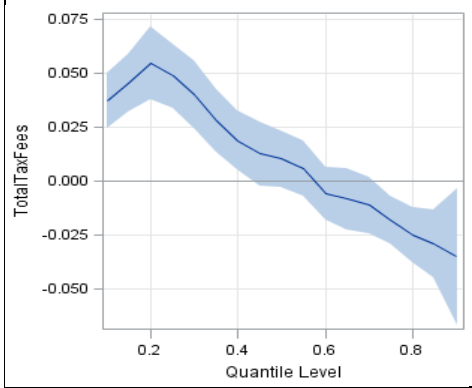
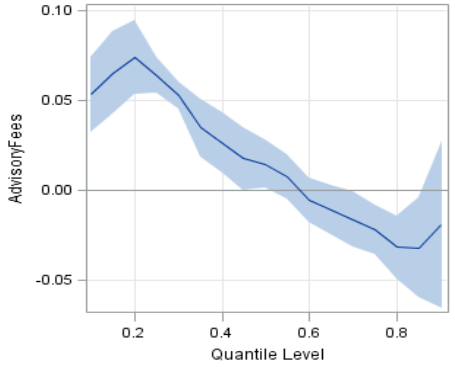
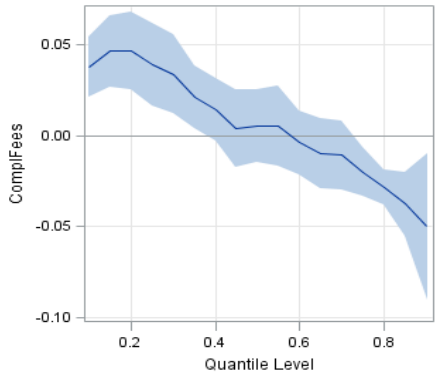
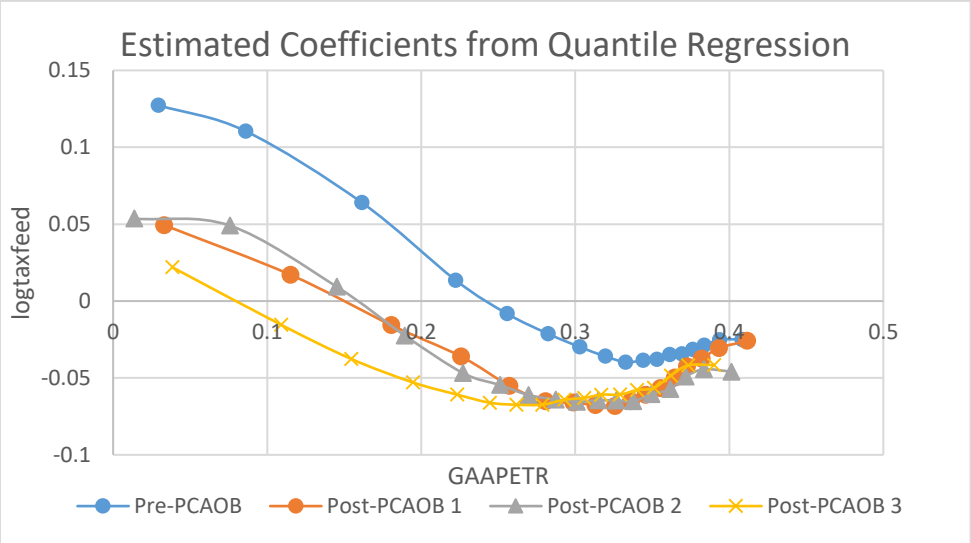
Total Tax Fees	Tax Advisory Fees	Tax Compliance Fees
(Dependent Variable = GAAPETR)		
		
(Dependent Variable = CASHETR)		
		

Figure 2 presents graphs from quantile regressions of GAAPETR (CASHETR) on fees paid for auditor-provided tax services, test of H1. The breakdown of tax fees is obtained from the Audit Analytics database. Total fees paid for tax services are presented in column (1) , while column (2) and (3) present the results for tax advisory and tax compliances fees respectively. The y-axis is the coefficient values from the quantile regressions. The x-axis measures quantile levels of tax avoidance, lower values represent higher tax avoidance.

Figure 3
Quantile Regressions of Tax Avoidance on Auditor-provided Tax Services
Time Trend Analysis

Panel A: Dependent Variable = *GAAPETR*



Panel B: Dependent Variable = *CASHETR*

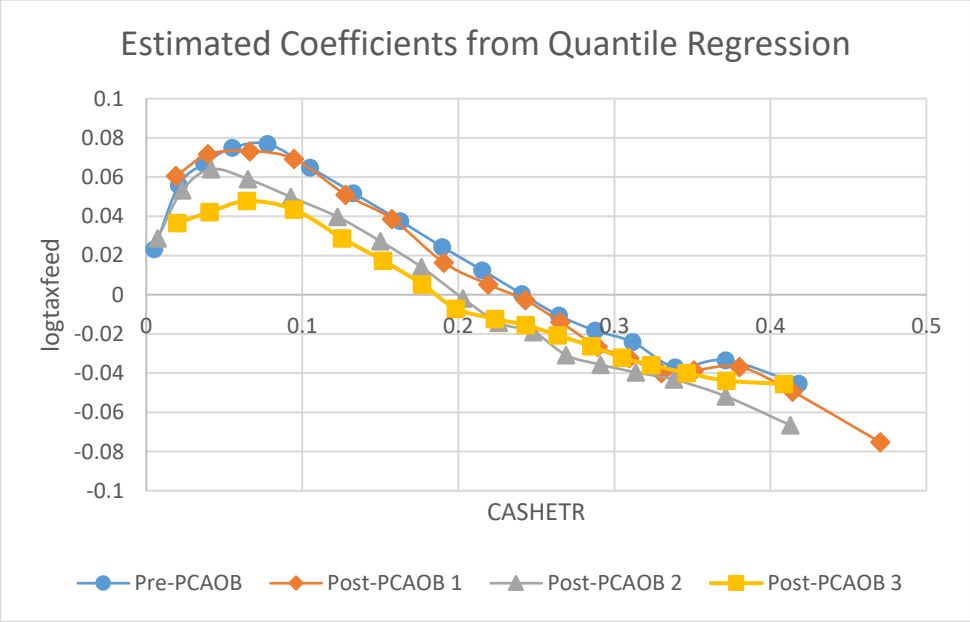
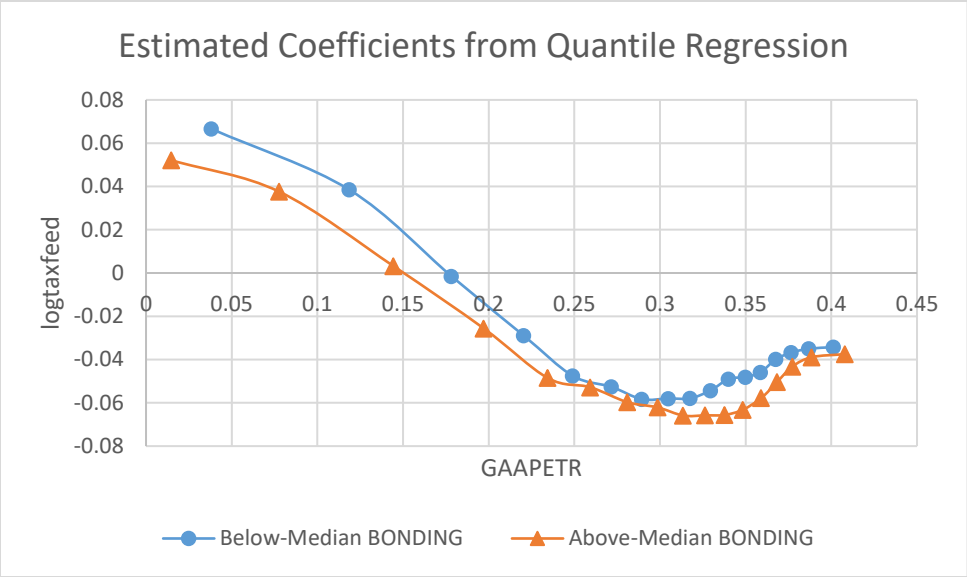


Figure 3 presents the time trend analysis of the association between *GAAPETR* (*CASHETR*) and fees paid for auditor-provided tax services (*LogAPTS*). We adopt the sample partition conducted in Lennox (2016) and partition our sample into three-year windows: i) Pre-PCAOB (Jan 1, 2002 thru July 26, 2005), ii) Post PCAOB 1 (Oct 06, 2006 to Dec 31, 2009), iii) Post-PCAOB 2 (Jan 1, 2010 thru Dec 31, 2012), and iv) Post PCAOB 3 (Jan 1, 2013 thru Dec 31, 2016). We then run quantile regressions within each window. The y-axis is the coefficient values from the quantile regressions. The x-axis is *GAAPETR* (*CASHETR*) in Panel A (Panel B), lower values represent higher tax avoidance.

Figure 4
Quantile Regressions of Tax Avoidance on Auditor-provided Tax Services
Tests for the Effects of Economic Bonding

Panel A: Dependent Variable = *GAAPETR*



Panel B: Dependent Variable = *CASHETR*

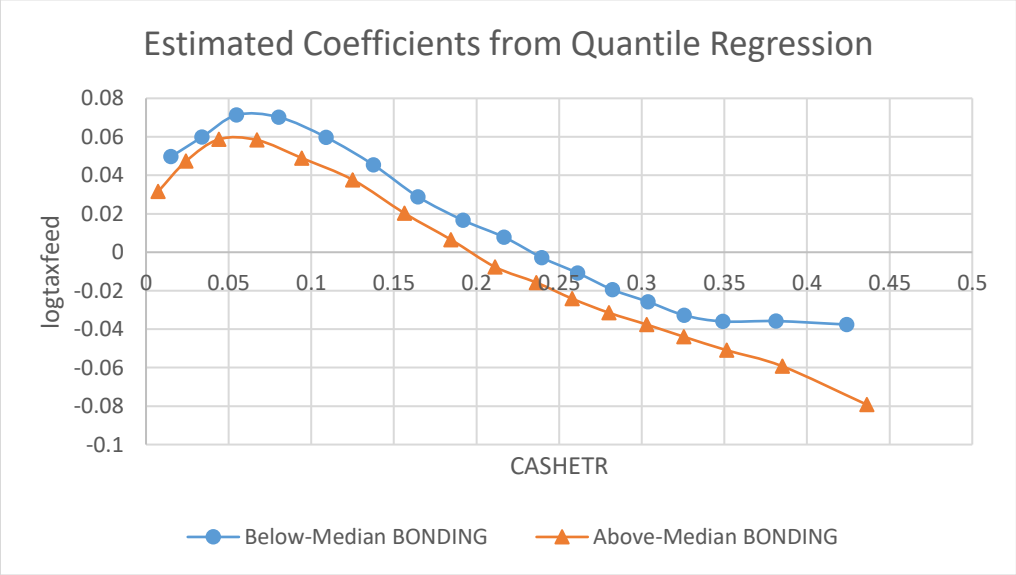
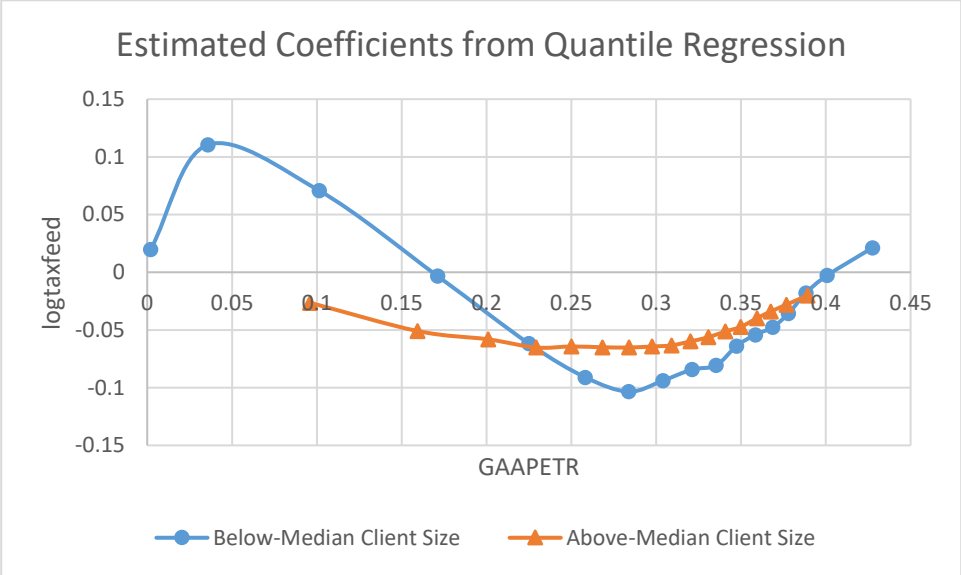


Figure 4 presents the results from quantile regressions of tax avoidance on fees paid for auditor-provided tax services (*LogAPTS*). In Panels A and B, we partition the sample into lower and higher economic bonding based on the median value for *BONDING* in each fiscal year. The y-axis is the coefficient values from the quantile regressions. The x-axis is *GAAPETR* (*CASHETR*) in Panel A (Panel B), lower values represent higher tax avoidance. *BONDING* is the ratio of total tax fees to audit fees, higher values represent greater economic bonding. The definitions for *GAAPETR*, *CASHETR*, and *LogAPTS* are provided in Appendix A.

Figure 4 (continued)
Quantile Regressions of Tax Avoidance on Auditor-provided Tax Services
Tests for the Effects of Economic Bonding

Panel C: Dependent Variable = *GAAPETR*



Panel D: Dependent Variable = *CASHETR*

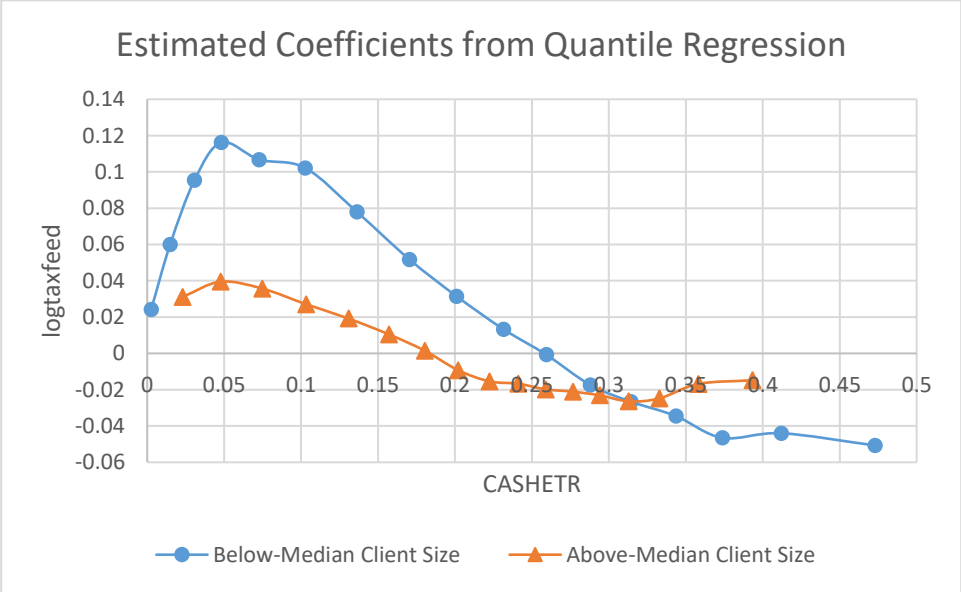


Figure 4 presents the results from quantile regressions of tax avoidance on fees paid for auditor-provided tax services (*LogAPTS*). In Panels C and D, we partition the sample into lower and higher economic bonding based on the median value for client size (*SIZE*) in each fiscal year. Client size is a major determinant in the amount of revenue that can be generated from non-audit, and audit, services. The y-axis is the coefficient values from the quantile regressions. The x-axis is *GAAPETR* (*CASHETR*) in Panel A (Panel B), lower values represent higher tax avoidance. The definitions for *GAAPETR*, *CASHETR*, *SIZE*, and *LogAPTS* are provided in Appendix A.

Table 1
Sample Selection

All Client-year observations in Audit Analytics for the period 2002-2016	189,936
Less: Non-U.S. domiciled clients	(24,389)
Less: Restatement observations	(14,474)
Less: Mutual funds, trusts, limited partnerships and other flow-through entities	(60,086)
Equals: Client-years matched with Compustat	90,987
Less: Client-years without sufficient data to compute variables	(36,243)
Less: Client-years with zero or negative pre-tax income ($PI \leq 0$)	(26,735)
Less: Client-years that did not purchase auditor-provided tax services	(7,586)
Final Sample of Client-year observations	20,423

Table 2
Descriptive Statistics
(n = 20,423)

Variable	Mean	Std. Dev.	25th Pctl.	50th Pctl.	75th Pctl.
Fees Paid					
APTS($M)	0.3870	0.7340	0.0360	0.1175	0.3671
LogAPTS	0.2505	0.3418	0.0354	0.1111	0.3127
Audit_Fees($M)	2.3164	3.4250	0.4410	1.1330	2.5720
LogAuditFees	0.9060	0.6872	0.3653	0.7575	1.2731
Tax Avoidance					
GAAPETR	0.2868	0.1634	0.2065	0.3148	0.3706
CASHETR	0.2284	0.1914	0.0755	0.2138	0.3254
Control Variables					
SIZE	6.6469	2.1089	5.3826	6.7796	8.0327
FI	0.0204	0.0378	0.0000	0.0000	0.0276
LEV	0.1766	0.1800	0.0039	0.1390	0.2828
PPE	0.2768	0.2616	0.0798	0.1879	0.3931
R&D	0.0284	0.0523	0.0000	0.0000	0.0327
DEP	0.0423	0.0286	0.0237	0.0365	0.0536
BTM	0.5151	0.3870	0.2671	0.4436	0.6770
EQINC	0.0013	0.0051	0.0000	0.0000	0.0000
PT_ROA	0.1147	0.0996	0.0473	0.0887	0.1514
NOL	0.4819	0.4997	0.0000	0.0000	1.0000
ΔNOL	0.0004	0.0791	0.0000	0.0000	0.0004
CASH	0.1945	0.2178	0.0364	0.1141	0.2741
ABACC	0.0137	0.1377	-0.0533	0.0037	0.0619

All continuous variables are winsorized at the 1st and 99th percentile except for *GAAPETR* and *CASHETR*, which are winsorized to range between 0 and 1. Variables are defined in Appendix A.

Table 3 – Correlation Matrix

		(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*
(1)	*GAAPETR*		**0.3380**	**-0.0705**	0.0121	**-0.0967**	**-0.0146**	**0.0343**	**-0.1945**	0.0098	**0.0330**	-0.0085
(2)	*CASHETR*	**0.3504**		-0.0024	**0.0225**	-0.0032	**-0.0855**	**-0.1132**	**-0.1060**	**-0.0450**	**0.0383**	-0.0103
(3)	*LogAPTS*	**-0.0969**	**0.0406**		0.5097	**0.2206**	**0.1547**	**-0.0489**	**-0.0204**	**-0.0552**	**-0.1256**	**0.1152**
(4)	*SIZE*	**-0.0453**	**0.0728**	**0.5435**		**0.2677**	**0.1906**	**0.0907**	**-0.0608**	**-0.0312**	**-0.3062**	**0.1216**
(5)	*FI*	**-0.1928**	**0.0546**	**0.3073**	**0.3090**		**-0.0590**	**-0.0765**	**0.1741**	-0.0035	**-0.1570**	**0.0622**
(6)	*LEV*	**-0.0269**	**-0.0864**	**0.2307**	**0.2678**	0.0070		**0.3148**	**-0.2542**	**0.1116**	**-0.1328**	**0.0393**
(7)	*PPE*	**0.0602**	**-0.0780**	0.0096	**0.1078**	**-0.0752**	**0.3392**		**-0.2712**	**0.5244**	**0.0246**	**0.0633**
(8)	*R&D*	**-0.2584**	**-0.0837**	**0.0769**	-0.0088	**0.2934**	**-0.2623**	**-0.2489**		-0.0015	**-0.1635**	**-0.0685**
(9)	*DEP*	**0.0172**	**-0.0385**	0.0003	0.0037	0.0071	**0.1375**	**0.6139**	0.0075		**-0.1062**	**-0.0201**
(10)	*BTM*	**0.0363**	-0.0002	**-0.1332**	**-0.3053**	**-0.1435**	**-0.0618**	0.0070	**-0.1890**	**-0.1206**		-0.0133
(11)	*EQINC*	**-0.0396**	-0.0098	**0.1480**	**0.2090**	**0.0909**	**0.1556**	**0.1132**	**-0.0812**	**-0.0150**	0.0041	
(12)	*PT_ROA*	**0.2010**	**0.1379**	**-0.0187**	**0.1013**	**0.1295**	**-0.2496**	0.0059	**0.0759**	**0.0783**	**-0.4489**	-0.0104
(13)	*NOL*	**-0.1547**	**-0.01054**	**0.1000**	**0.0944**	**0.1955**	**0.0736**	**-0.0971**	**0.1501**	**0.0293**	**-0.0459**	0.0024
(14)	*ΔNOL*	-0.0082	**-0.0615**	**-0.0673**	**-0.0734**	**-0.0296**	**-0.0712**	**-0.0576**	**0.0315**	**-0.0283**	**-0.0151**	**-0.0205**
(15)	*CASH*	**-0.1032**	-0.0039	**-0.0630**	**-0.0920**	**0.1379**	**-0.5141**	**-0.3599**	**0.4049**	**-0.1033**	**-0.1975**	**-0.1351**
(16)	*ABACC*	**-0.0845**	**-0.0389**	**-0.0618**	**-0.1048**	**-0.0369**	**0.0504**	**0.0514**	**-0.0583**	**-0.0320**	**0.1080**	**0.0316**

(Continued on next page)

Table 3 – Correlation Matrix (continued)

		(12)	*(13)*	*(14)*	*(15)*	*(16)*
(1)	*GAAPETR*	**0.0970**	**-0.1051**	**-0.0238**	**-0.0969**	**-0.1105**
(2)	*CASHETR*	**0.0182**	**-0.0879**	**-0.0349**	**-0.0550**	**-0.0424**
(3)	*LogAPTS*	**-0.0585**	**0.0718**	**-0.0316**	**-0.1217**	**-0.0436**
(4)	*SIZE*	**0.0323**	**0.0848**	**-0.0715**	**-0.1200**	**-0.1264**
(5)	*FI*	**0.1967**	**0.1445**	**-0.0347**	**0.1214**	**-0.0316**
(6)	*LEV*	**-0.2141**	**0.0677**	**-0.0601**	**-0.3816**	**0.0340**
(7)	*PPE*	**-0.0234**	**-0.1102**	**-0.0479**	**-0.3167**	**0.0629**
(8)	*R&D*	**0.0907**	**0.1207**	**0.0398**	**0.4828**	0.0063
(9)	*DEP*	**0.0883**	**0.0180**	**-0.0312**	**-0.0994**	0.0031
(10)	*BTM*	**-0.3483**	**-0.0442**	0.0132	**-0.1638**	**0.0626**
(11)	*EQINC*	**0.0558**	**-0.0190**	-0.0076	**-0.0706**	**0.0327**
(12)	*PT_ROA*		**-0.0973**	**0.0844**	**0.3275**	-0.0082
(13)	*NOL*	**-0.0887**		**-0.0503**	**0.0262**	**0.0357**
(14)	*ΔNOL*	**0.0637**	**-0.0393**		**0.0558**	**0.0248**
(15)	*CASH*	**0.2668**	**0.0602**	**0.0504**		**-0.0509**
(16)	*ABACC*	**-0.0815**	**0.0262**	0.0006	**-0.1055**	

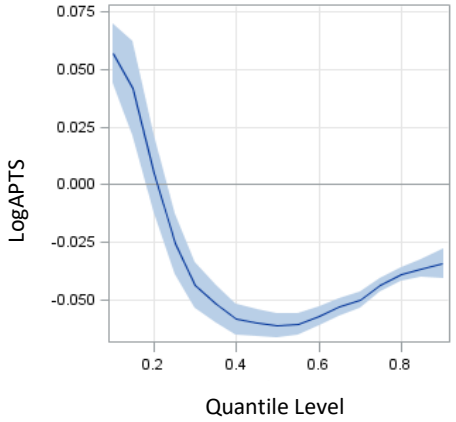
This table reports correlations between variables. Pearson (Spearman) correlations are in the upper (lower) diagonal. **Bold** indicates statistical significance at less than 0.05 level (two-tailed). See Appendix A for variable definitions.

Table 4
Quantile Regression of Auditor-Provided Tax Services on Tax Avoidance

Panel A (GAAPETR)

Percentile	Coefficient		(Std. Error)
90th	*-0.0344*	***	0.0033
85th	*-0.0365*	***	0.0018
80th	*-0.0388*	***	0.0015
75th	*-0.0435*	***	0.0015
70th	*-0.0501*	***	0.0018
65th	*-0.0531*	***	0.0020
60th	*-0.0569*	***	0.0021
55th	*-0.0605*	***	0.0023
50th	*-0.0612*	***	0.0027
45th	*-0.0600*	***	0.0030
40th	*-0.0585*	***	0.0035
35th	*-0.0516*	***	0.0042
30th	*-0.0437*	***	0.0050
25th	*-0.0258*	***	0.0066
20th	*0.0047*		0.0087
15th	*0.0416*	***	0.0104
10th	*0.0570*	***	0.0066

Estimated Coefficient by Quantile Level with 95% CL



Percentile	Coefficient		(Std. Error)
23rd	-0.0137	*	0.0074
22nd	-0.0090		0.0078
21st	-0.0019		0.0082
20th	0.0047		0.0086
19th	0.0111		0.0086
18th	0.0185	**	0.0092
17th	0.0270	***	0.0096

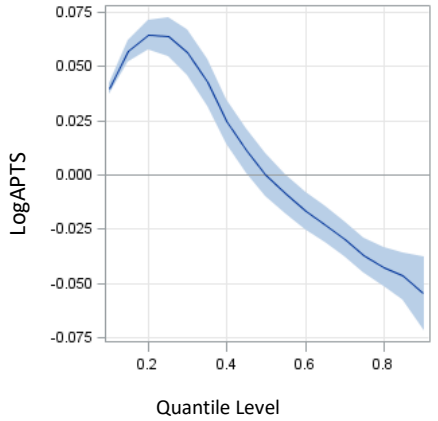
This table presents results from quantile regressions of tax avoidance (*GAAPETR)* on fees paid for auditor-provided tax services (*LogAPTS*). We calculate standard errors that are clustered by clients. *, **, and *** indicate statistical significance at less than the 0.10, 0.05, and 0.01 levels respectively. We base statistical significance on two-sided *p*-values. Variables are defined in Appendix A. *LogAPTS* is winsorized at the 1st and 99th percentiles and *GAAPETR* is winsorized to range between 0 and 1.

Table 4 (continued)
Quantile Regression of Auditor-Provided Tax Services on Tax Avoidance

Panel B (CASHETR)

Percentile	Coefficient		(Std. Error)
90th	*-0.0547*	***	0.0087
85th	*-0.0466*	***	0.0055
80th	*-0.0425*	***	0.0046
75th	*-0.0374*	***	0.0041
70th	*-0.0297*	***	0.0040
65th	*-0.0228*	***	0.0043
60th	*-0.0169*	***	0.0044
55th	*-0.0089*	*	0.0046
50th	*0.0002*		0.0050
45th	*0.0111*	**	0.0052
40th	*0.0247*	***	0.0052
35th	*0.0425*	***	0.0054
30th	*0.0564*	***	0.0053
25th	*0.0636*	***	0.0047
20th	*0.0645*	***	0.0036
15th	*0.0571*	***	0.0026
10th	*0.0396*	***	0.0013

Estimated Coefficient by Quantile Level with 95% CL



Percentile	Coefficient		(Std. Error)
55th	-0.0089	*	0.0046
53rd	-0.0044		0.0047
51st	-0.0016		0.0049
49th	0.0031		0.0051
47th	0.0060		0.0051
45th	0.0111	**	0.0052
43rd	0.0175	***	0.0053

This table presents results from quantile regressions of tax avoidance, *CASHETR*, on fees paid for auditor-provided tax services (*LogAPTS*). We calculate standard errors that are clustered by clients. *, **, and *** indicate statistical significance at less than the 0.10, 0.05, and 0.01 levels respectively. We base statistical significance on two-sided *p*-values. Variables are defined in Appendix A. *LogAPTS* is winsorized at the 1st and 99th percentiles and *CASHETR* is winsorized to range between 0 and 1.

Table 5
Multivariate Regression of the Determinants of Tax Avoidance

	(1)	(2)	(3)	(4)
Variable	**GAAPETR** Coefficient (Std. errors)	**CashETR** Coefficient (Std. errors)	**GAAPETR** Coefficient (Std. errors)	**CashETR** Coefficient (Std. errors)
LogAPTS			-0.0380***	-0.0119**
			(0.0050)	(0.0060)
SIZE	0.0021*	0.0034***	0.0053***	0.0044***
	(0.0010)	(0.0011)	(0.0011)	(0.0013)
FI	-0.3378***	0.0323	-0.3082***	0.0416
	(0.0507)	(0.0608)	(0.0513)	(0.0613)
LEV	-0.0321***	-0.0811***	-0.0276**	-0.0797***
	(0.0112)	(0.0128)	(0.0112)	(0.0129)
PPE	-0.0085	-0.1139***	-0.0151	-0.1160***
	(0.0118)	(0.0135)	(0.0118)	(0.0136)
R&D	-0.3886***	-0.3466***	-0.3901***	-0.3471***
	(0.0432)	(0.0485)	(0.0431)	(0.0486)
DEP	-0.1395*	0.3237***	-0.1264	0.3278***
	(0.0818)	(0.0919)	(0.0812)	(0.0919)
BTM	0.0172***	0.0127**	0.0188***	0.0131**
	(0.0061)	(0.0064)	(0.0061)	(0.0064)
EQINC	-0.8518**	-0.5591	-0.7386**	-0.5237
	(0.3491)	(0.3854)	(0.3480)	(0.3849)
PT_ROA	0.2406***	0.0091	0.2333***	0.0068
	(0.0203)	(0.0217)	(0.0204)	(0.0217)
NOL	-0.0182***	-0.0394***	-0.0183***	-0.0395***
	(0.0032)	(0.0038)	(0.0032)	(0.0038)
ΔNOL	-0.0594***	-0.1069***	-0.0569***	-0.1061***
	(0.0208)	(0.0181)	(0.0208)	(0.0181)
CASH	-0.0645***	-0.0635***	-0.0680***	-0.0646***
	(0.0095)	(0.0110)	(0.0095)	(0.0110)
ABACC	-0.1338***	-0.0412***	-0.1310***	-0.0403***
	(0.0101)	(0.0102)	(0.0101)	(0.0101)
Constant	0.3101***	0.2737***	0.2961***	0.2693***
	(0.0140)	(0.0179)	(0.0141)	(0.0181)
Observations	20,423	20,423	20,423	20,423
Adjusted R^2	0.1121	0.0926	0.1162	0.0928
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

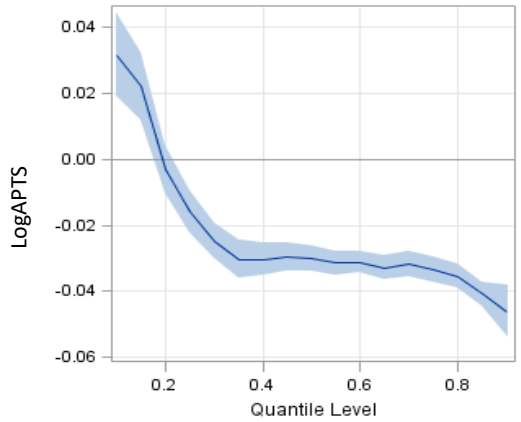
Columns (1) and (2) present the results from OLS regressions of the determinants of tax avoidance that are correlated with auditor-provided tax services (*LogAPTS*). The residuals from columns (1) and (2), i.e., the variation in ETRs not explained by these determinants, are used as the dependent variables in quantile regression tests of H1. Columns (3) and (4) includes *LogAPTS* as a determinant and shows the mean effect of *LogAPTS* on tax avoidance. Standard errors are clustered by clients. *, **, and *** indicate statistical significance at less than the 0.10, 0.05, and 0.01 levels respectively. We base statistical significance on two-sided *p*-values. All variables are defined in Appendix A, and all continuous variables are winsorized at the 1st and 99th percentiles.

Table 6
Quantile Regression of the *Residual* of Tax Avoidance on Auditor-Provided Tax Services

Panel A (Residual of GAAPETR)

Percentile	Coefficient		(Std. Error)
90th	*-0.0462*	***	0.0040
85th	*-0.0408*	***	0.0019
80th	*-0.0355*	***	0.0018
75th	*-0.0334*	***	0.0020
70th	*-0.0319*	***	0.0020
65th	*-0.0329*	***	0.0019
60th	*-0.0311*	***	0.0017
55th	*-0.0314*	***	0.0019
50th	*-0.0300*	***	0.0019
45th	*-0.0295*	***	0.0022
40th	*-0.0303*	***	0.0025
35th	*-0.0303*	***	0.0029
30th	*-0.0247*	***	0.0027
25th	*-0.0160*	***	0.0033
20th	*-0.0031*		0.0037
15th	*0.0221*	***	0.0053
10th	*0.0318*	***	0.0065

Estimated Coefficient by Quantile Level with 95% CL



Percentile	Coefficient		(Std. Error)
23rd	-0.0119	***	0.0036
22nd	-0.0090	**	0.0040
21st	-0.0063	*	0.0037
20th	-0.0031		0.0037
19th	0.0005		0.0043
18th	0.0063	*	0.0037
17th	0.0097	***	0.0033

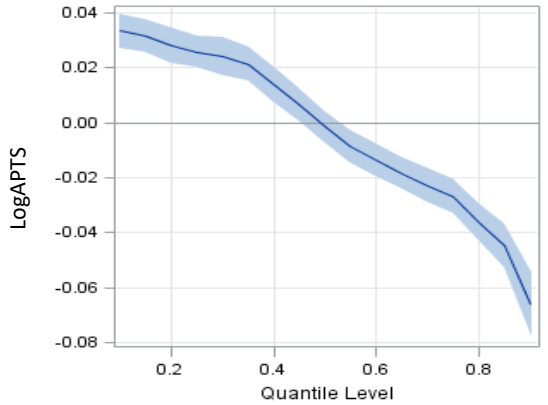
This table presents results from quantile regressions of tax avoidance on fees paid for auditor-provided tax services (*LogAPTS*). The dependent variable is the residual estimates from equation (2), which controls for other determinants of tax avoidance. We calculate standard errors clustered by clients. *, **, and *** indicate statistical significance at less than the 0.10, 0.05, and 0.01 levels, respectively. We base statistical significance on two-sided *p*-values. Variables are defined in Appendix A. *LogAPTS* is winsorized at the 1st and 99th percentiles and *GAAPETR* is winsorized to range between 0 and 1.

Table 6 (continued)
Quantile Regression of the *Residual* of Tax Avoidance on Auditor-Provided Tax Services

Panel B (Residual of CASHETR)

Percentile	Coefficient		(Std. Error)
90th	*-0.0663*	***	0.0059
85th	*-0.0449*	***	0.0040
80th	*-0.0362*	***	0.0035
75th	*-0.0267*	***	0.0031
70th	*-0.0228*	***	0.0032
65th	*-0.0184*	***	0.0028
60th	*-0.0135*	***	0.0029
55th	*-0.0086*	***	0.0030
50th	*-0.0013*		0.0029
45th	*0.0068*	**	0.0030
40th	*0.0137*	***	0.0033
35th	*0.0214*	***	0.0032
30th	*0.0241*	***	0.0036
25th	*0.0258*	***	0.0030
20th	*0.0281*	***	0.0033
15th	*0.0315*	***	0.0030
10th	*0.0333*	***	0.0031

Estimated Coefficient by Quantile Level with 95% CL



Percentile	Coefficient		(Std. Error)
55th	-0.0086	***	0.0030
53rd	-0.0057	*	0.0029
51st	-0.0013		0.0029
49th	-0.0002		0.0029
47th	0.0024		0.0027
45th	0.0068	**	0.0030
43rd	0.0108	***	0.0030

This table presents results from quantile regressions of tax avoidance on fees paid for auditor-provided tax services (*LogAPTS*). The dependent variable is the residual estimates from equation (2), which controls for client-specific determinants of tax avoidance. We calculate standard errors clustered by clients. *, **, and *** indicate statistical significance at less than the 0.10, 0.05, and 0.01 levels, respectively. We base statistical significance on two-sided *p*-values. Variables are defined in Appendix A. *LogAPTS* is winsorized at the 1st and 99th percentiles.